AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATION

[0000.4] This application is a 35 USC 371 application of PCT/EP 2005/008516 filed on August 5, 2005.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0001] with the following amended paragraph:

[0001] ~~Technical field~~ **Field of the Invention**

Page 2, please replace paragraph [0007] with the following amended paragraph:

[0007] In the case of known methods, which are based on excitation with short pulses or flanks (stepped signals), a broadband signal is used because of the correspondingly wide bandwidth which occurs with short signals. However, because of the stress limit with respect to the signal amplitudes or the signal power in the generation process, or because of restrictions to the detection [[f]] **of** small signals after excitation on the same line, this broadband signal can be used only disadvantageously. The reason for this is that, as the transmission power is increased, the gain which is required for this purpose is also associated with an increase in the noise level, which has a disadvantageous effect on detection with an optimum signal-to-noise ratio. Furthermore, when the signal voltages are relatively high, only less advantageous switches or input amplifiers can be used. It should also be remembered that increasing the transmission power of amplifiers results in relatively high costs in order to provide high voltages and/or high power levels with components such as these.

Page 4, please replace paragraph [0009] with the following amended paragraph:

[0009] ~~Description of the invention~~ **SUMMARY OF THE INVENTION**

Page 5, please replace paragraph [0012] with the following amended paragraph:

[0012] In the example mentioned above, the ultrasound signals are chosen such that the amplitudes and the power in all of the frequency ranges, also integrated over the pulse width, have a profile which is as **closely** matched as possible. In this case, the phase angle for broadband noise varies randomly, or varies in a predetermined continuous manner in the case of other signals. For example, a broadband pulse with a noisy signal is produced with a pulsed power distribution which is approximately square-wave over time (with respect to the time domain) as a result of the predetermined [[Or]] **or** chosen bandwidth, which limits the rise time and the fall time of the pulse.

Page 7, please replace paragraph [0017] with the following amended paragraph:

[0017] ~~Drawing~~ **BRIEF DESCRIPTION OF THE DRAWINGS**

Please replace paragraph [0020] with the following amended paragraph:

[0020] ~~Embodiment variants~~ **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Page 8, please replace paragraph [0022] with the following amended paragraph:

[0022] In the following text: the expression "pseudo-random noise" (prn) means a signal which satisfies one or more [[35]] **of thirty five** tests for random distribution. Although the signal appears to lack any defined pattern, a pseudo-random noise signal contains a frequency

of pulses which are repeated but only after a relatively long time or a relatively long pulse sequence.

Please replace paragraph [0023] with the following amended paragraph:

[0023] The connecting component 1, which is in the form of a screw and as illustrated in figure 1, has a screw head 2 as well as a shank 3. A threaded part 4 runs underneath the shank 3. A transducer 5 [[f]] or an ultrasound pulse 7, which is in the form of a chirp pulse, is located on the screw head 2. Chirp pulses are pulses such as linear chirp pulses which have frequencies whose centroid rises or falls linearly as a function of the frequency with the time from the start of the pulse. The chirp method makes it possible to achieve time compression during detection, resulting in a minimum pulse width for the transducer. Furthermore, delta-pulse production from limited-frequency signal spectra is feasible, by the superimposition of a large number of sinusoidal or cosinusoidal partial waves around the phase 0° or 180° (Π) in the case of a cosine function. In the most general case, the signal components can be represented by an exponential function in the form $e(^{j\omega t})$. The greater the number of frequencies involved in the excitation, the stronger is the maximum or the more pronounced is the maximum which can be observed after compression. Compression is carried out after the digitizing of the received signal by means of a computer and computer programs. In this case, the received signal is first of all subjected to Fourier transformation. The phases of the spectral components are then shifted such that the phase angle 0 is obtained in the absence of the prestressing force in a representation using cosine functions for a time which is defined with respect to the excitation time. After back-transformation, this results in a compressed pulse with a marked maximum amplitude at this time. The position of the signal with the

maximum amplitude is determined by adaptation of one half-cycle in the vicinity of this maximum. The shifting of the spectral components and the form of the matching function are chosen to be the same for all prestressing forces for the respective connecting component 1. The delay time differences which are used to determine the prestressing force are obtained by forming the difference between the measurement of the result and the measurement without any prestressing force. The relationship between the prestressing force and any observed delay time differences for the respective connecting component 1 or a batch thereof is determined empirically by means of tensioning machines which allow a precise amount of stressing force to be applied. The respective individual measurement is evaluated, and the stressing force indicated, by means of the relationship determined in this way.

Please replace paragraph [0024] with the following amended paragraph:

[0024] The transducer 5 as shown in figure 1 has an electrode 5.1 to which the signal line is connected, as well as a protective layer 5.2 located underneath it. A piezoelectric thin film 5.3 is located underneath the protective layer 5.2 and **<u>on</u>** the upper face of the screw head 2. The reference symbol 6 denotes the propagation path of the ultrasound pulse 7, which is injected at the transducer 5, through the connecting element 1, which is in the form of a screw. The transducer 5 for the ultrasound pulse 7 at the same time represents the output point for an ultrasound pulse echo 8. The time which passes between the injection of an ultrasound pulse 7 at the transducer 5 into the connecting component 1, which is in the form of a screw, and the outputting of the ultrasound pulse echo 8, likewise at the transducer 5, is indicated by t.

Please replace paragraph [0025] with the following amended paragraph:

[0025] The component, which is annotated Z and may be a circulator, a switch, a reflectometer or an electrical connection[[:]], gets into the signal transmission line between the connecting component 1, which is in the form of a screw, ~~of a screw,~~ to the arbitrary function generator AFG and an amplifier V. [[An]] **The** amplifier V is connected at 2, and is followed by a transient recorder TR. This is connected to a computer PC, which itself drives the arbitrary function generator [[AFO]] **AFG**. The arbitrary function generator AFG is itself connected to Z. A repetition rate generator RG controls the transient recorder TR and the arbitrary function generator AFG. A clock transmitter TG controls the arbitrary function generator AFG, the transient recorder TR and the repetition rate generator RG. The PC is connected by data lines to the arbitrary function generator AFO and to the transient recorder TR.

Page 13, please replace paragraph [0033] with the following amended paragraph:

[0033] If the ultrasound signal delay times t are short, for example as is the case when the connecting components 1 are in the form of short screws, [[arid]] **and**/or when the transducers 5 operate with a particularly broad bandwidth, the bandwidth to be used can also advantageously be distributed between a plurality of successive pulsed excitations. The distribution of the bandwidth to be used between a plurality of successive pulsed excitations may be randomly linear or may be achieved in some other way, for example by weighting specific bandwidth areas. A phase angle which is defined for the ultrasound pulse 7, that is to say for example with respect to its pulse center, is in each case chosen on the basis of the

frequency interval which can still be resolved by means of a Fourier method, such as FFT or some other classical resolution method, and is associated therewith. The phase angle which is in each case associated with the ultrasound pulse 7 is therefore also known during the further processing and, in particular, during the evaluation in the course of the compression of the signals.

Page 14, please add the following new paragraph after paragraph [0036]:

[0037] The foregoing relates to a preferred exemplary embodiment of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.

Please delete page 15.